

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/013987

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ C07D309/38, 309/26, 213/81, A61K7/06, 31/366, A61P1/16, 11/00, 13/12, 17/02, 9/10, 9/12, 17/14, 43/00, C07C311/17, 311/51, 47/55, 69/73, 47/575, 49/258, 235/16, 235/84, 255/40, 271/28, 275/38, 255/29, 259/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ C07D309/38, 309/26, 213/81, A61K7/06, 31/366, A61P1/16, 11/00, 13/12, 17/02, 9/10, 9/12, 17/14, 43/00, C07C311/17, 311/51, 47/55, 69/73, 47/575, 49/258, 235/16, 235/84, 255/40, 271/28, 275/38, 255/29, 259/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CAPLUS (STN), CAOLD (STN), REGISTRY (STN)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 97/35565 A1 (Toray Industries, Inc.), 02 October, 1997 (02.10.97), Full text & EP 841063 A1 & US 6215016 B1 & AU 9720436 A & CN 1194580 A & NO 9705439 A	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73
A	JP 50-46666 A (Toray Industries, Inc.), 25 April, 1975 (25.04.75), Full text (Family: none)	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
17 December, 2004 (17.12.04)

Date of mailing of the international search report
28 December, 2004 (28.12.04)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/28493 A2 (PRESIDENT AND FELLOWS OF HARVARD COLLEGE), 26 April, 2001 (26.04.01), Full text & US 6756394 B1	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73
A	JP 41-1412 B (Research Institute For Production Development), 03 February, 1966 (03.02.66), Full text (Family: none)	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73
A	DE 2728243 A (HENKEL KGAA), 11 January, 1979 (11.01.79), Full-text & FR 2395025 A & BE 868398 A & AT 7804551 A & NL 7806035 A & CH 634988 A	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73
P,A	WO 03/080592 A1 (Sumitomo Chemical Co., Ltd.), 02 October, 2003 (02.10.03), Full text & JP 2004-175780 A & AU 2003220931 A1	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73
P,A	JP 2004-123621 A (Sumitomo Chemical Co., Ltd.), 22 April, 2004 (22.04.04), Full text (Family: none)	1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, 73

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: the claims shown in extra sheet
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 50, 52, 54, 55, 57, 59, 60, 62, 64, 66, 68, 70, and 72 pertain to methods for treatment of the human body by therapy and relate to a subject matter for which this International Searching Authority is not required to search.
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
(See extra sheet.)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Claims 1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, and 73

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

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<Continuation of Box No. II>

Claims 50, 52, 54, 55, 57, 59, 60, 62, 64, 66, 68, 70, and 72

<Continuation of Box No. III>

1) Claims 1-25, 46-49, 51, 53, 56, 58, 61, 63, 65, 67, 69, 71, and 73 relate to a compound having a 3-(1-oxo-2-propenyl)-2H-pyran-2-one skeleton, a process for producing the same, and a medicinal use of the compound.

2) That part of claim 26 which relates to the formula (XXVI-1) and claims 28, 33-37, and 43-45 relate to a benzaldehyde derivative having a specific substituent in any of the 2-, 3-, and 4-positions.

3) That part of claim 26 which relates to the formula (XXVI-2) and claims 27 and 29 relate to a benzaldehyde derivative having a specific substituent in either of the 2- and 3-positions and having no substituent in the 4-position.

4) That part of claim 26 which relates to the formula (XXVI-3) and claims 31, 32, and 38 relate to a benzaldehyde derivative having a specific substituent in either of the 3- and 4-positions and having no substituent in the 1- and 6-positions.

5) That part of claim 26 which relates to the formula (XXVI-4) and claims 30, 39, and 40 relate to a benzaldehyde derivative having a specific substituent in the 3-position.

6) Claims 26 and 42 relate to 6-formyl-2-[(2-methoxyethyl)aminocarbonyl]pyridine.

7) Claim 41 relates to a specific benzaldehyde derivative represented by the formula (XLI).

These seven groups of inventions are not considered to be a group of inventions so linked as to form a single general inventive concept.

<With respect to subject matter for search>

Claim 1 includes the term "a substituent on a carbon atom not belonging to the X₀ group, Y₀ group, and Z₀ group" in an explanation on X_α. However, it is unclear as to what structure the term implies even when the statements in the description are investigated. That term hence makes the scope of the compounds of the invention unclear.

Therefore, in this international search report, a search was made through prior-art documents with respect to the compounds specified in the description.

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